

CLAIMS

What is claimed is:

1. A hydrodynamic clutch arrangement comprising:
 2. a clutch housing having a drive-side wall for connecting to a drive unit and
 3. a takeoff-side wall for connecting to a gearbox;
 4. a pump wheel in the housing;
 5. a turbine wheel in the housing, the turbine wheel and the pump wheel
 6. forming a hydrodynamic circuit in the housing; and
 7. a clutch device located inside the housing, the clutch device bringing the
 8. housing into and out of working connection with the pump wheel.
1. 2. A hydrodynamic clutch device as in claim 1, wherein the clutch device comprises a separating wall having a first side facing the hydrodynamic circuit and a second side facing the takeoff-side wall of the housing, the clutch device further comprising a control chamber between the second side and the takeoff-side wall, and a first control line connected to a pressure supply system.
1. 3. A hydrodynamic clutch arrangement as in claim 2 comprising a clutch piston which is not rotatable with respect to the housing, the clutch piston forming the separating wall.
1. 4. A hydrodynamic clutch arrangement as in claim 2 wherein the hydrodynamic circuit has a prevailing pressure, the pressure supply system supplying

3 the control system with a control pressure having a value which is essentially the same
4 as the prevailing pressure.

1 5. A hydrodynamic clutch arrangement as in claim 4 wherein the
2 pressure control system can switch the pressure in the control chamber between the
3 control pressure and a residual pressure which is less than the control pressure.

1 6. A hydrodynamic clutch arrangement as in claim 5 wherein the
2 residual pressure is essentially the same as atmospheric pressure.

1 7. A hydrodynamic clutch arrangement as in claim 3 wherein the
2 clutch piston comprises at least one seal for sealing the hydrodynamic circuit from the
3 control chamber.

1 8. A hydrodynamic clutch arrangement as in claim 7 wherein the seal
2 allows a predetermined residual leakage between the hydrodynamic circuit and the
3 control chamber.

1 9. A hydrodynamic clutch arrangement as in claim 3 further
2 comprising at least one friction surface which can be urged toward the takeoff-side
3 housing wall by the clutch piston, the at least one friction surface acting as a seal
4 between the hydrodynamic circuit and the control chamber.

1 10. A hydrodynamic clutch arrangement as in claim 9 further
2 comprising at least one friction lining, each said friction lining forming a respective said
3 friction surface.

1 11. A hydrodynamic clutch arrangement as in claim 10 wherein each
2 said friction lining has a first radial area provided with openings which allow the flow of
3 coolant, and a second radial area which is essentially free of interruptions in the
4 circumferential direction.

1 12. A hydrodynamic clutch arrangement as in claim 10 wherein each
2 said friction lining is provided with openings to allow flow of coolant, the openings
3 extending across the lining in the radial direction.

1 13. A hydrodynamic clutch arrangement as in claim 12 further
2 comprising a seal located radially inside the at least one friction lining, the seal acting
3 between the clutch piston and the takeoff-side housing wall.

1 14. A hydrodynamic clutch arrangement as in claim 13 further
2 comprising at least one through channel located radially inside the friction lining and
3 radially outside the seal.

1 15. A hydrodynamic clutch arrangement as in claim 13 further
2 comprising at least one disk provided with at least one friction lining, the clutch piston
3 cooperating with the at least one disk.

1 16. A hydrodynamic clutch arrangement as in claim 15 wherein said
2 clutch device is a multi-disk clutch having a plurality of disks arranged axially, said disks
3 comprising said at least one disk having at least one friction lining.

1 17. A hydrodynamic clutch arrangement as in claim 16 further
2 comprising:

3 an outer disk carrier which is fixed to one of said pump wheel and said
4 clutch piston, the multi-disk clutch comprising at least one outer disk which is connected
5 to the outer disk carrier non-rotatably but with freedom of axially movement; and

6 an inner disk carrier fixed to the takeoff-side housing wall, the multi-disk
7 clutch comprising at least one inner disk which is connected to the inner disk carrier
8 non-rotatably but with freedom of axially movement.

1 18. A hydrodynamic clutch arrangement as in claim 17 wherein the seal
2 is provided between the second side of the clutch piston and the inner disk carrier.

1 19. A hydrodynamic clutch arrangement as in claim 18 further
2 comprising a seal carrier fixed to the clutch piston, the seal carrier having a recess in
3 which the seal is held.

1 20. A hydrodynamic clutch arrangement as in claim 16 further
2 comprising at least one flow channel provided in at least one friction surface of at least
3 one disk of the multi-disk clutch.

1 21. A hydrodynamic clutch arrangement as in claim 17 wherein the
2 takeoff side of the housing and the pump wheel each comprise a hub, the outer disk
3 carrier being connected nonrotatably to one of the pump wheel and the clutch piston,
4 the clutch piston being connected nonrotatably to one of the hubs.

1 22. A hydrodynamic clutch arrangement as in claim 21 wherein the
2 outer disk carrier is connected nonrotatably to the clutch piston, the clutch piston being
3 connected nonrotatably to the pump wheel hub.

1 23. A hydrodynamic clutch arrangement as in claim 21 wherein the
2 clutch piston has a radially inner area comprising a base having axial teeth which
3 connect the base nonrotatably but with freedom of axial movement to said one of said
4 hubs.

1 24. A hydrodynamic clutch arrangement as in claim 21 wherein the
2 takeoff-side housing hub is provided with an axial stop which limits axial travel of the
3 clutch piston toward the pump wheel.

1 25. A hydrodynamic clutch arrangement as in claim 24 further
2 comprising an axial spring which pretensions the clutch piston toward the takeoff-side
3 housing wall, the axial spring being supported against the axial stop.

1 26. A hydrodynamic clutch arrangement as in claim 21 further
2 comprising a radially inner seal between the clutch piston and the one of the hubs.

1 27. A hydrodynamic clutch arrangement as in claim 2 wherein the
2 takeoff-side housing wall comprises a hub having connections for connecting the control
3 chamber to the pressure supply system.

1 28. A hydrodynamic clutch arrangement as in claim 1 further
2 comprising a bridging clutch for bypassing said hydrodynamic circuit.

1 29. A hydrodynamic clutch arrangement as in claim 28 wherein said
2 bridging clutch comprises a torsional vibration damper.

1 30. A hydrodynamic clutch arrangement as in claim 1 wherein the
2 clutch device can be closed by hydraulic pressure within the clutch housing.

1 31. A hydrodynamic clutch arrangement as in claim 2 wherein the
2 clutch device does not transmit any torque when the hydraulic pressure on the
3 separating wall is that same as that in the control chamber.

1 32. A hydrodynamic clutch arrangement as in claim 1 wherein the
2 clutch device is opened when the drive unit is started.

1 33. A hydrodynamic clutch arrangement as in claim 2 wherein the
2 pressure in the control system can be automatically switched by the pressure supply
3 system between the pressure present in the hydrodynamic circuit and a residual
4 pressure which is lower than the pressure present in the hydrodynamic circuit.